

Introduction to metabolism: Carbohydrate metabolism; glycolysis, Warburg effect and Alcoholic fermentations, TCA cycle, regulation of glycolysis and TCA cycle, gluconeogenesis, glycogenesis, glycogenolysis and pentose phosphate pathway..

Lipid Metabolism: Hydrolysis of triacylglycerols, transport of fatty acids into mitochondria, β -oxidation of saturated fatty acids, oxidation of unsaturated and odd chain fatty acids, ATP yield from fatty acid oxidation. Biosynthesis of saturated and unsaturated fatty acids. Biosynthesis and regulation of triglycerides and cholesterol.

Amino acid Metabolism: General reactions of amino acid metabolism: transamination, oxidative deamination and decarboxylation. Urea cycle. Biosynthesis of amino acids (Glutamine, tryptophan and Histidine). Degradation of amino acids.

Nucleotide Metabolism: Sources of the atoms in the purine and pyrimidine molecules. Biosynthesis and degradation of purines and pyrimidines. Regulation of purine and pyrimidine biosynthesis.

Introduction to bioenergetics: Photosynthetic and respiratory electron transfer chain, photophosphorylation. Mechanism of ATP production, inhibitors of electron transport chain and uncouplers of oxidative phosphorylation.

Suggested readings:

- Nelson D L and Cox M M (2008) Lehninger's Principles of Biochemistry, Macmillan Pub.
Berg J M, John L, Stryer L (2012) Biochemistry 6th Edn., W H Freeman & Co. Ltd.
Zubay G (1999) Biochemistry 4th Edn., W C Brown Commun, Inc.
Harper's Illustrated Biochemistry 29th Edn. (2012) , Murray et al. McGraw Hill Pubn.
Voet D & Voet J G (2004) Biochemistry 3rd Edn., John Wiley & Sons.
Gareth & Grisham (2008) Biochemistry 4th Edn., Brooks Cole Pbn.
Devlin T. M. (2010) Textbook of Biochemistry with Clinical correlations 7th Edn., Wiley Pubn.
Harris D A (2009) Bioenergetics at a Glance-An Illustrated Introduction, Blackwell Sci. Pub.
Nicholls D G et al (2002) Bioenergetics 3rd edn., Academic Press.
Rai A N (1990) handbook of Symbiotic Cyanobacteria, CRC Press
Rawn J D (2005) Biochemistry 4th edn., Prentice Hall
Davies David D (2011) Intermediary Metabolism in Plants, Cambridge University Press.

PAPER ~~X~~ V
BIOCHEMISTRY PRACTICAL - V

MM 25

1. Isolation of casein from milk.
2. Isolation and estimation of starch from potato
3. Isolation and estimation of glycogen from animal tissues
4. Isolation and estimation of photosynthetic pigments.

Suggested readings:

Boyer R F (2009) Modern Experimental Biochemistry 3rd edn. , 5th Impression Pearson edn.
Sadasivam S and Manickam A (2005) Biochemical Methods,(Rev Edn.) New Age Int. Pub, New Delhi.
Jayaraman (2011) Laboratory Manual in Biochemistry, New Age Int. Pub.
Plummer D T (2008 reprint) An Introduction to Practicals in Biochemistry 3rd Edn., Tata McGraw- Hill
Sambrook J and Russel D W (2012) Molecular Cloning 4th edn., CSH Lab Press
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G (2011) Practical Biochemistry, Pub Jaypee bros.
Nigam A & Ayyagiri A (2008) Lab Manual in Biochemistry, Immunology & Biotechnology, Tata McGraw Hill
Yadav V. K. et al (2012) Biochemistry & Biotechnology- A Lab Manual, Pointer Publns.

Nutritional Biochemistry

Nutrition and dietary habits: Nutritive values of carbohydrates, fats, protein, vitamins (A, D, E, K vit B complex and vit C) and minerals (Ca, Fe and iodine). Basal metabolic rate (BMR); Calorimetry; Specific dynamic action (SDA) and Recommended Daily Allowance (RDA) of foods; Protein-Calorie malnutrition (Kwashiorkor and Marasmus); Overnutrition & Obesity.

Clinical Biochemistry

Basic concepts of clinical biochemistry: Definition and scope in health and diseases; Collection and preservation of biological fluids [blood, plasma, serum, urine, cerebral spinal fluid (CSF) and amniotic fluid]; Analysis of blood, urine and CSF. Normal values of important constituents in blood (Plasma/serum), CSF and urine, clearance test for urea.

Enzymes used in clinical diagnosis; Enzyme pattern in health and diseases (lipases, amylases, cholinesterases, alkaline and acid phosphatases, SGOT, SGPT, LDH and CPK); Isoenzymes and diagnostic tests; Functional tests of liver and kidney. Inborn errors of metabolism (alkaptonuria, phenylketonuria, albinism). Metabolic disorders (Hypo- and Hyper- glycemia, gout and porphyrias).

Suggested readings:

- Guyton A C & Hall (2010) Textbook of Medical Physiology 12th Edn., W B Saunders.
Barrett K E et. Al. (2009) Ganong's Review of Medical Physiology 23rd edn. LANGE Basic Science McGraw Hill Medical
Ganong W F (2003) Review of Medical Physiology 21st edn. Appleton & Lange USA
Bhagavan N V et. al. (2011) Essentials of Medical Biochemistry with Clinical cases 1st Edn., Acad. Press.
Burtis et al (2010) Tietz Fundamentals of Clinical Chemistry 6th Edn. Elsevier
Wu et al (2006) Tietz Clinical Guide to Laboratory Test 4th edn. Saunders Pbn.
Trueman P (2007) Nutritional Biochemistry MJP Pubn.
Elsawy H (2010) Nutritional Biochemistry, Lap Lambert Acad Pbn.
Haugen S (2010) Handbook of Nutritional Biochemistry, Nova Science Pbn.
Grooper S S (2000) Biochemistry of Human Nutrition – A Desk Reference 2nd Edn. Wadsworth Pbn.
Luxton R (2010) Clinical Biochemistry, Viva Books
Berg J M (2011) Biochemistry 7th Edn. W H Freeman
Devlin T. M. (2010) Textbook of Biochemistry with Clinical correlations 7th Edn., Wiley Pubn

PAPER ~~XII~~ VI
BIOCHEMISTRY PRACTICAL - VI

MM 25

1. Estimation of blood haemoglobin.
2. Estimation of serum GOT & serum GPT.
3. Estimation of urea in blood.
4. Estimation of serum alkaline phosphatase.
5. Estimation of bilirubin.
6. Estimation of blood glucose.
7. Estimation of creatinine.

Suggested readings:

Boyer R F (2009) Modern Experimental Biochemistry 3rd edn. , 5th Impression Pearson edn.
Sadasivam S and Manickam A (2005) Biochemical Methods,(Rev Edn.) New Age Int. Pub, New Delhi.
Jayaraman (2011) Laboratory Manual in Biochemistry, New Age Int. Pub.
Plummer D T (2008 reprint) An Introduction to Practicals in Biochemistry 3rd Edn., Tata McGraw- Hill
Farrell et al (2005) Experiments in Biochemistry: A Hands-on Approach 2nd Edn. Brooks Cole Pbn.
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G K (2011) Practical Biochemistry, Pub Jaypee bros.
Nigam A & Ayyagiri A (2008) Lab Manual in Biochemistry, Immunology & Biotechnology, Tata McGraw Hill
Yadav V. K. et al (2012) Biochemistry & Biotechnology- A Lab Manual, Pointer Publins.
Bhargava/ Gupta (2010) Practical Biochemistry, CBS Publishers
Sawhney S K. (2005) Introductory Practical Biochemistry, Alpha Science International Ltd.
Divya Santhi (2010) An Easy Guide for Practical Biochemistry, Jaypee brothers & Medical Publ.